

### **REMARKS**

Claims 1-2 and 4-7 are pending and under consideration in the above-identified application.

In the Office Action dated January 13, 2009, the Examiner rejected claims 1-2 and 4-7.

With this Amendment, claims 1 and 5 were amended. No new matter has been introduced as a result of the amendments.

#### **I. Claim Interpretation**

The Examiner rejected claim 6 for containing a product by process limitation is not given patentable weight. Applicant respectfully traverses this rejection.

The structure implied by the process steps should be considered when the process steps impart distinctive characteristics to the final product. See, *In re Garner*, 412 F.2d 276, 279 (CCPA 1979). The process limitation in claim 6, namely mechanofusion, is a technique for particle-to-particle fusion that generates a mechanical-chemical reaction between two or more materials. Specifically, mechanofusion generates surface fusion through a combination of high shear and compression forces acting on the particles. Particles that are mechanofused *create a new material with different chemical properties*. See Morton, U.S. Publication No. 20080063719 & Yasuhiro et al., U.S. Publication No. 20070259284. As such, the mechanofusion process imparts distinctive characteristics on the final product.

Wariishi et al. (U.S. Patent No. 6,902,850), which was cited by the Examiner, teaches a calcination method that employs high temperatures, the reference does not teach the application of shear and compression forces used in mechanofusion. Applicant requests proof that the calcination method would provide the same type of fusion between particles as that created by mechanofused particles. Thus, even if mechanofusion is considered a product-by-process type

limitation, the process step clearly imparts distinctive characteristics to the final product. As such, the mechanofusion in step 6 should be given patentable weight. Applicant respectfully requests that the Examiner provide evidence to the contrary.

## **II. 35 U.S.C. § 103 Obviousness Rejection of Claims**

Claims 1 -2 and 5-7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Oesten et al. (US 2001/0046628 A1) in view of Spitler et al. (US 2004/0197657). Applicants respectfully traverse this rejection.

Claims 1 and 5 require a coating layer that is adhered to the outer surface of an inner particle. The coating layer is a homogeneous lithium-titanium *compound* that unlike coatings made of alkali metal compounds and oxides, which are randomly dispersed, has a single phase of polycrystalline spinel. Specification, pages 4-5. This coating significantly improves the high temperature property of lithium nickel oxide without decreasing lithium ion conductivity. Specification, pages 6, 33-34 & Table 1.

The Examiner suggests that it would have been obvious to “modify the mixtures of alkali metal compounds and metal oxides coating of Oesten et al. to include a spinel lithium titanate oxide as taught by Spitler et al. in order to enhance the charge and discharge rate of the electrochemical cell.” Office Action, page 6. However, Oesten et al. does not teach or even fairly suggest a mixture of compound oxides, namely,  $\text{Li}_4\text{Ti}_5\text{O}_{12}$ ,  $\text{Li}_2\text{TiO}_3$ ,  $\text{Li}_2\text{Ti}_3\text{O}_7$  and  $\text{Li}_4\text{Ti}_{4.90}\text{Mn}_{0.10}\text{O}_{12}$ , as required by the claims. Oesten et al. specifically teaches a lithium mixed oxide particle coated with a mixture of alkali metals *and* metal oxides. Oesten et al., paragraph [0033-0034], [0037]. At most, Oesten et al. teaches a mixture of alkali metals *and* titanium oxide, but does not teach or suggest a compound oxide as required by the claims. As such,

Oesten et al. clearly teaches that the components are *separate* rather than combined to form a compound oxide.

Furthermore, the purpose of the coating in Oesten et al. is to inhibit reactions between the electrode materials and acids. Oesten et al., paragraph [0037]. As such, Oesten et al. provides a suggestion to use other compounds that would inhibit reactions between the electrode materials and acid but does not provide any suggestion to use a different material as coating for the purpose of improving conductivity. In fact, using a spinel lithium titanate oxide in place of the mixture of alkali metals and metal oxides would change the intended purpose of the Oesten coating, which is to prevent reactions between the electrode materials and acid. "A proposed modification cannot render the prior art unsatisfactory for its intended purpose." MPEP § 2145 X (D). As such, Oesten et al. does not provide any motivation to use a coating to improve conductivity and doing so would change the intended purpose of the alkali metal and metal oxide coating.

Spitler et al. teaches the use of lithium titanium spinel oxide as the positive material for the cathode of a lithium ion battery. Additionally, Spitler et al. teaches that blending lithium titanate spinel oxide into the active material allows for high charge and discharge rates. Spitler et al., [0017]; [0022]. However, as discussed above, Oesten et al. provides no motivation to use lithium titanium spinel oxide as a coating because Oesten et al. teaches a mixture that is two separate components, an alkali metal and a metal oxide. Additionally, Oesten et al teaches a coating to prevent reactions between the electrode materials and acid. Using the lithium titanium spinel oxide as a coating in place of the mixture of alkali metal and metal oxide would change the intended purpose of the Oesten et al. coating. It is submitted that the Examiner's reasoning is based on improper hindsight reasoning.

Thus, taken singularly or in combination with each other, the cited references fail to either teach or even fairly suggest the required elements of independent claims 1 and 5. As such, claims 1 and 5 are patentable over the cited references, as are dependent claims 2, 3 and 4 for at least the same reasons. Accordingly, Applicant respectfully requests the above rejections be withdrawn. Additionally, Applicant requests that the rejection of dependent claim 4, which is based in part on Oesten et al. and Spitler et al. be withdrawn for at least the same reasons.

**III. Conclusion**

In view of the above amendments and remarks, Applicant submits that all claims are clearly allowable over the cited prior art, and respectfully requests early and favorable notification to that effect.

Respectfully submitted,

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